

REMARKS

The Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-14 are pending, none of which is amended. Claim 1 is independent. The Examiner is respectfully requested to reconsider the rejections in view of the remarks set forth herein.

Examiner Interview

If, during further examination of the present application, any further discussion with the Applicants' Representative would advance the prosecution of the present application, the Examiner is encouraged to contact Carl T. Thomsen, at 1-703-208-4030 (direct line) at his convenience.

Drawings

The Examiner has not indicated whether or not the drawings have been accepted. Clarification is requested in the next official communication.

Claim for Priority

The Examiner has not acknowledged the Applicants' claim for foreign priority. Clarification is requested in the next official communication.

Information Disclosure Citation

The Applicants thank the Examiner for considering the reference supplied with the Information Disclosure Statements filed April 13, 2005 and September 16, 2005, and for providing the Applicants with initialed copies of the PTO/SB/08 forms filed therewith.

Rejections Under 35 U.S.C. §103(a)

Claims 1-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rabarot et al. (U.S. 5,734,490).

This rejection is respectfully traversed.

Arguments Regarding the Patentability of Independent Claim 1

Novelty

The subject matter of the present patent application is indisputably novel as the independent claim 1 comprises features not disclosed in Rabarot et al. In particular, Rabarot et al. fail to reveal that the forming of the light shaping unit takes place before the forming of the micromechanical structure and that the light shaping unit is made in a different material than the micromechanical structure.

Thus, the subject matter of claim 1 clearly differs from what is known from Rabarot et al. Rabarot et al. merely teach a common solution to provide microoptical components and optomechanical microdeflectors with microlens displacement.

The invention according to the independent claim 1 is thus novel.

Obviousness

The underlying problem of the present invention, stating from Rabarot et al. is to provide a simplified production of the light shaping unit on a micromechanical structure, compared with the prior art. Support for this problem definition is found on page 1, line 39 – page 2, line 3 of the description.

This is achieved through a method of producing a compact movable structure for a light shaping unit comprising the steps of: forming a light shaping unit from a material provided on a carrier of a first material, and forming a micromechanical structure from the carrier in a second, different material, whereby the forming of the light shaping unit is performed before the forming of the micromechanical structure.

According to the prior art solution presented in Rabarot et al., the micromechanical structure comprises arms 55-1, 55-2, 55-3, 55-4 that are connected to a lens 83 from the side, see figure 5B. The lens 83 is formed together with the micromechanical structure by depositing firstly the starting material 76 on a silica substrate. A resin layer 80 is then deposited on the silica layer. The structure is then formed using a conventional photolithography procedure. The assembly is thereafter heated such that the resin melts and transforms under action of surface tension into spherical drops which solidify when the plate cools, see column 6, line 12-38.

Thus according to Rabarot et al., the lens 83 is formed of the same material as the micromechanical structure.

However, according to the present invention as set forth in independent claim 1, different material than the micromechanical structure 14, 16, 18, 22, 28, 29 see page 3, line 34-42. The lens 12 is formed using a polymer, such as CYTOP or Parylene, while the micromechanical structure 14, 16, 18, 22, 28, 29 is formed out of a silicon layer 44 and resist layer 42.

By using different materials for the light shaping unit 12 and the micromechanical structure 14, 16, 18, 22, 28, 29, these can be optimized for best performance considering the optical properties and robustness of the mechanics, respectively, see page 7, line 13-15.

Through the production method according to the present invention, where the forming of the light shaping unit 12 in a first material takes place before the forming of the micromechanical structure 14, 16, 18, 22, 28, 29 in a second, different material, it is possible to form a light shaping unit 12 with an underlying micromechanical structure 14, 16, 18, 22, 28, 29 in a simple way and that does not have any difficult compatibility requirements between forming of micromechanics 14, 16, 18, 22, 28, 29 and forming of light shaping unit 12. Expensive later mounting of individual elements in the light shaping unit 12 is also avoided, see page 7, line 6-11.

Thus, the problem that the invention solves is not at all disclosed in Rabarot et al. On the contrary Rabarot et al. teach a prior art method that has been described in the present application as having great disadvantages. Typically, prior art devices and methods such as the ones disclosed in Rabarot et al. wherein the lens and the micromechanical structure are

made out of the same material; provide a compromise between the optical properties, mechanical properties and costs.

Instead, the Rabarot et al. document is leading the person skilled in the art away from the present invention by stipulating that the microlens and the microbeam are advantageously made of the same material, see column3, line 14-15 and claim 20.

As pointed out by the Examiner, the feature of firstly forming the light shaping unit, and secondly forming the micromechanical structure, is not mentioned in Rabarot et al.

This is however an important feature of the present invention, as the lens thus is formed while the substrate is strong. By the present production method, the tedious work of placing a separately produced lens inside a fragile separately produced micromechanical structure is omitted. Thus mass production of light shaping units through embossing is facilitated.

Starting from Rabarot et al., it cannot be obvious to arrive at the solution of the invention as stated above. It is therefore, clear that the person skilled in the art would not be motivated to modify Rabarot et al. based on this document alone.

At least for the reasons explained above, the Applicants respectfully submit that the combination of elements as set forth in independent claim 1 is not disclosed or made obvious by the prior art of record, including Rabarot et al.

Therefore, independent claim 1 is in condition for allowance.

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All dependent claims are in condition for allowance due to their dependency from allowable independent claims, or due to the additional novel features set forth therein.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a) are respectfully requested.

CONCLUSION

Since the remaining patents cited by the Examiner have not been utilized to reject claims, but merely to show the state of the art, no comment need be made with respect thereto.

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, he is invited to telephone Carl T. Thomsen (Reg. No. 50,786) at (703) 208-4030(direct line).

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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